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# bart impact program

## THE IMPLICATIONS OF BART'S ECONOMIC, EMPLOYMENT AND FINANCIAL IMPACTS FOR THE TRANSPORTATION DISADVANTAGED

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Imp. -- Employ. -- CA -- SF --  
Aged Trans. " " "  
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technical memorandum



The BART Impact Program is a comprehensive, policy-oriented study and evaluation of the impacts of the San Francisco Bay Area's new rapid transit system (BART).

The program is being conducted by the Metropolitan Transportation Commission, a nine-county regional agency established by state law in 1970.

The program is financed by the U. S. Department of Transportation, the U. S. Department of Housing and Urban Development, and the California Department of Transportation. Management of the Federally funded portion of the program is vested in the U. S. Department of Transportation.

The BART Impact Program covers the entire range of potential rapid transit impacts, including impacts on traffic flow, travel behavior, land use and urban development, the environment, the regional economy, social institutions and life styles, and public policy. The incidence of these impacts on population groups, local areas, and economic sectors will be measured and analyzed. Finally, the findings will be interpreted with regard to their implications for the planning of transportation and urban development in the Bay Area and other metropolitan areas.

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IMPLICATIONS FOR THE  
TRANSPORTATION DISADVANTAGED PROJECT  
IMPLICATIONS OF BART'S ECONOMIC,  
EMPLOYMENT AND FINANCIAL IMPACTS  
FOR THE TRANSPORTATION DISADVANTAGED

March, 1978

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And

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT  
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16. Abstract  This report examines the economic, employment and financial impacts that the 71 mile Bay Area Rapid Transit System has had to date on the transportation disadvantaged. Three special population groups are the focus of analysis — ethnic minorities, the elderly and handicapped. These groups are of special concern for transportation planning and policy because of either low-income status or mobility related impairments.  Findings are reported from the investigation of seven issues related to BART's impacts for the transportation disadvantaged on increased accessibility to employment opportunities, direct employment, business and neighborhood viability and the costs of financing operations and construction. Evaluation of these findings is made in the context of the level, nature, and degree of equity in the incidence of BART's economic impacts. Based on the findings of the study, implications for the transportation disadvantaged of a regional rapid rail transit investment are presented in terms of policy considerations for other areas in which similar systems may be considered.					
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## SUMMARY AND CONCLUSIONS

### Purpose of the Implications for the Transportation Disadvantaged Project (ITD)

The Implications for the Transportation Disadvantaged Project is a special study within the BART Impact Program included in order to develop the implications of BART's impacts for the transportation disadvantaged. The entire range of the impacts on the transportation disadvantaged related to the construction and operations of the San Francisco Bay Area Rapid Transit System are considered:\*

- Environmental
- Mobility and Accessibility
- Economic, Employment and Financial
- Land Use and Urban Development.

This is the third of four interim reports to be prepared in the ITD Project prior to the preparation of the Final Report. This report focuses on the mobility and accessibility impacts on the transportation disadvantaged associated with BART's introduction into the regional transportation system of the San Francisco Bay Area.

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\*Urban Dynamics Associates. Implications of BART's Environmental Impacts for the Transportation Disadvantaged. BART Impact Program. Document No. DOT-BIP-TM-34-10-78. Metropolitan Transportation Commission, Berkeley. January, 1978.

Urban Dynamics Associates. Implications of BART's Mobility and Accessibility Impacts for the Transportation Disadvantaged. BART Impact Program. (Draft Technical Memorandum). Metropolitan Transportation Commission, Berkeley. December, 1977.

Urban Dynamics Associates. Implications of BART's Economic, Employment and Financial Impacts for the Transportation Disadvantaged. BART Impact Program. (Draft Technical Memorandum). Metropolitan Transportation Commission, Berkeley. December, 1977.

Urban Dynamics Associates. Implications of BART's Land Use and Urban Development Impacts for the Transportation Disadvantaged. BART Impact Program. (Draft Technical Memorandum). Metropolitan Transportation Commission, Berkeley. January 1978.



## Definition of Transportation Disadvantaged

The special population groups included in the ITD Project and in this report are:

- the elderly,
- the handicapped, and
- ethnic minorities (Blacks, Spanish-heritage, Asians and other minorities).

These groups are a special concern for transportation policy due to specific physical disabilities which limit mobility or due to general disadvantages vis a vis society, such as low income status.

## Population Characteristics of the Transportation Disadvantaged

In the Greater BART Service Area (San Francisco, Alameda, Contra Costa and the northern portion of San Mateo County), ethnic minority persons constitute nearly one-third of the total population (31.9%); 12.7 percent Spanish-heritage, 11.8 percent Black, and 7.4 percent other. Within the Primary BART Service Area (132 zones from which 80% of all BART trips originate), ethnic minorities are found in greater concentrations; 13.6 percent Spanish-heritage, 14.3 percent Black, and 7.4 percent other. Over fifty percent (50.7%) of the Black population in the three county area live in census tracts within one-quarter mile of BART, forty percent (39.6%) of the Spanish heritage population and only twenty-seven (27.2%) of the non-Black, non-Spanish population.

Based on a classification criterion of more than forty percent (40%), eighteen (18) of the thirty-four (34) BART stations are located in areas (one-half mile radius) of high total ethnic minority concentration. Within the immediate station impact area (one-quarter mile) there are 41,293 persons living around stations located in non-downtown and 2,138 in downtown areas of high concentrations of ethnic minorities; 13,200 in non-downtown and 13,815 in downtown areas of low concentrations of ethnic minorities.

The elderly (65 years and older) constitute 9.7 percent of the total population residing within the Greater BART Service Area and 10.2 percent in the Primary BART Service Area. Handicapped persons appear to be generally evenly distributed in the BART service areas, with no identifiable concentrations revealed by census tract data. The elderly are also fairly evenly distributed throughout the BART service area; however, the greatest concentrations of older persons are found around downtown stations. Four of the eight station areas with high concentrations of elderly (greater than 15%) are located in downtown areas.



## Issue Investigations: Conclusions

Seven issues relating to the economic, employment and financial impacts of the BART system for the transportation disadvantaged are examined in this report. Information developed in the various project areas of the BART Impact Program has been applied in the evaluation of each issue.

ISSUE NUMBER ONE: "Does BART provide increased opportunity of employment for minority central city residents by increasing accessibility to outlying suburban office, commercial and industrial areas?"

Conclusion: Analysis of BART's overall impact on transit accessibility to employment locations in the Bay Area, has shown that while BART's impact has been modest (average 5 minute travel time savings to the top 50 employment zones from all zones in the Greater BART Service Area), the largest accessibility gains have been from outlying residential areas to downtown workplaces in San Francisco, Oakland and Berkeley. Accessibility modeling analyses conducted in the BART Impact Program have not permitted the testing of the proposition that accessibility gains from central residential areas to outlying employment areas may be comparable to suburban-to-CBD average accessibility gains. BART has provided transit service to some outlying areas which are not served in the No-BART Alternative. But generally, stations access to workplaces in outlying areas is poor both in terms of walking distance and egress-related bus service. Where outlying stations do provide good access to workplaces, it may be concluded that BART has provided increases in accessibility to some outlying employment opportunities for some central area minority residents.

However, based on analysis of the work travel patterns of ethnic minorities living in the Daly City corridor in San Francisco and those living in Oakland in the East Bay, the actual volume of commute trips to outlying employment centers appears negligible, by any mode including BART, except for work travel from Oakland to workplaces within the Fremont corridor. More Black and Spanish-heritage Oakland residents work at employment sites within this corridor than in any other work zone area in the region. Additionally, BART's share of these commute trips is relatively high. However, because of the level of zonal-aggregation in the analysis of



home to workplace area trip pattern, it is unclear what share of the reverse commute trips to this corridor represent travel to outlying workplaces. More generally, the BART Impact Program has not developed the type of data necessary to fully evaluate this issue. However, based on the best available information, it does not appear that BART, as of yet, has had a major impact on the access of central city minority residents to outlying employment opportunities.

ISSUE NUMBER TWO: "Is BART a catalyst for minority business enterprises and minority employment in and around the stations?"

Conclusion: To the extent that BART would increase the accessibility of an area where a station was located, increase pedestrian and vehicular circulation, or stimulate supporting land use policies encouraging commercial and office activities, it could be expected that expanded business and employment opportunities would occur around many BART stations. The results of the Land Use and Urban Development Project of the BART Impact Program to date suggest that these impacts have not occurred to the extent that might have been anticipated. Outside the central business areas of San Francisco and Oakland, where an indirect effect of BART is cited, little change in the character or extent of commercial and office activities has occurred, as of yet, in the BART experience. Within ethnic minority neighborhoods in the older, mixed land use areas of the urban part of the region, generally no major economic impact has been expressed in terms of significant new land use developments. A possible exception to this overall no-impact conclusion, may be the public sector employment opportunities implied by the construction of public facilities planned as part of the redevelopment program around the predominantly Black, downtown Richmond station.

BART has initiated an experimental permit program for concessions within selected station areas, which, if successful and supported by affirmative action policies, will provide new business opportunities for minority owned enterprises that are a direct result of BART and which would probably not exist in the No-BART alternative, the public transportation system judged most likely to have developed if BART had not been built.



ISSUE NUMBER THREE: "Have disruptions due to BART construction been a hardship to minority businesses, especially in the Mission area of San Francisco?"

Conclusion: (The investigation of this issue has been deferred until the results of Work Element 12: BART's Construction Impacts on Real Property and Retail Sales of the Land Use and Urban Development Project, are available. This issue may be addressed in the Final Report of the Implications for the Transportation Disadvantaged to be submitted in draft on February 27, 1978, if results of the LU & UD study are available.)

ISSUE NUMBER FOUR: "What has been the level and significance of BART's direct employment for minorities?"

Conclusion: The transit industry has historically been an active employer of ethnic minorities in the Bay Area. The representation of ethnic minority workers in the AC Transit and San Francisco MUNI work force is approximately 49 percent, and 40 percent in the BART work force. Both of these are significantly higher than the proportion of ethnic minority persons in the BART District population which is 32.6 percent. During its peak construction period from 1967 to 1971, as many as 35 percent of the construction work force were ethnic minority workers. The long-term potential impact of BART's construction hiring for improved ethnic minority employment opportunities may have been relatively small since minorities were underrepresented in supervisory and skilled job categories, while predominantly employed in laborer jobs with the smallest job advancement potential. However, BART has provided permanent ethnic minority employees with generally higher level job opportunities than are found in the older transit agencies of the region. In comparison to the No-BART Alternative, total ethnic minority employment in the transit sector of the Bay Area is only somewhat higher With-BART. However, the With-BART system is characterized by greater opportunities for minorities in higher income and job classification levels than in the No-BART Alternative.



ISSUE NUMBER FIVE: "Has BART lead to higher property taxes around stations, which in turn, force out ethnic minorities and the elderly?"

Conclusion: Increased assessed property valuation of housing in the vicinity of BART stations would imply the heaviest burden on the elderly and lower-income households, many of which are ethnic minorities, living in rental units in low and moderate cost housing. BART's impacts on taxable property could result from either higher development market potential of station areas resulting from perceived increases in accessibility, or from public land use control and redevelopment programs. At this point in the BART Impact Program studies, there is not sufficient evidence to determine if assessed property values have increased substantially around station areas, including those with high concentrations of ethnic minority population subgroups, or that these changes, if they have occurred, are related to BART. A definitive conclusion to this issue must await the findings of the incomplete property value study of the Land Use and Urban Development Project. However, the record of actual construction activities around BART stations, the relatively small impact of BART on housing development and rehabilitation activity suggest that residential property values have not increased substantially around most non-downtown BART stations as a result of BART.

BART's impact on property values is apparently the least in the older, mixed land use urban areas where ethnic minorities live in the greatest concentrations. It is unlikely that subsequent studies will show that significant relocation of lower income tenants has occurred around BART stations as a result of inflation of assessed residential property valuations related to BART's impacts on the development market or land use policies.

ISSUE NUMBER SIX: "Has BART's financing plan implied a disproportionate burden for low income persons, e.g. ethnic minorities, handicapped and the elderly?"

Conclusion: BART has contributed to a high level of financial support for the total transit system in a region which already had, before BART, one of the highest levels of per capita funding of public transportation in the country. The financing program used to pay for both BART's construction and annual operations has



relied heavily on local BART District taxes on property and retail sales. Incidence analysis of the burden of BART shows that 1) area households pay the majority of the local share of BART's costs, and 2) a heavier relative burden falls on low-income families and individuals. Since ethnic minority and elderly households represent a relatively large proportion of low and moderate income groups in the region, a disproportionate burden of BART's financing is borne by these households in terms of higher percentages of income used for local tax support of BART. A heavier burden is assumed by these households regardless of the extent to which they use or do not use BART.

Because of the 1964 enacted UMTA Section III Transit Capital Assistance Grant Program, the burden of financing the construction of a major commuter rail system in another region today would not impose as heavy a burden on local households in general, or the transportation disadvantaged in particular, as it has in the BART experience. Encountering shortfalls in fare revenues, unanticipated and escalating operational costs, BART has relied heavily on regressive local taxes to support operations. Compared to the bus and street-car operators in the BART District, BART's operating revenues support about the same proportion of total operating costs (about one-third). But the more substantial level of federal and state assistance for bus operations in the Bay Area is associated with lower requirements on local regressive tax sources in their budgets than in BART's operating budget.

ISSUE NUMBER SEVEN: "Is BART's fare policy inequitable in terms of user cost per mile, and if so, does this affect ethnic minorities to a greater degree than the general population?"

Conclusion: From the beginning of operations, BART has employed a fare structure which is graduated for distance of travel and which is therefore more equitable than a flat fare system in terms of cost per mile. The net effect of the fare changes adopted in 1975 has been to increase regressivity in the fare structure with respect to travel distance. The fare changes adopted in 1975 represented further reduction in the comparative costs for long trips versus short trips. The fare for shorter BART trips was generally increased more than for longer trips.



Since ethnic minority travelers in the Bay Area live closer in to the central areas of the region where typical travel distances are shorter, average user costs per mile are higher for these travelers than for the general population. Average fare per mile for trips to the San Francisco CBD is approximately 25 percent higher from stations located in areas of high ethnic minority concentration than from stations in areas of low ethnic minority concentrations. Decreasing marginal fare per mileage increment favors the long distance BART travelers, who are more likely to be White, upper-income suburban residents.

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## I. INTRODUCTION

### BART Impact Program

Built at a cost of \$1.6 billion, BART is a major element in the Bay Area program of transportation development. As the first regional rapid transit system to be built in this nation in more than 50 years, BART is of great interest to the Bay Area, other metropolitan areas across the country that are considering investments in improved transportation, and to the federal government which is providing financial aid for transportation improvements, urban development and environmental protection. Considering the magnitude of these concerns, there is a great need for accurate information on the impacts on the Bay Area resulting from the BART investment. Analyses and interpretations of BART impacts can be of vital assistance to those responsible for future transportation policy decisions throughout the nation.

The United States Department of Transportation (DOT) and the Department of Housing and Urban Development (HUD) have sponsored and are funding a long-term, policy-oriented study and evaluation of the impact of the new 71-mile Bay Area Rapid Transit system (BART) in the San Francisco-Oakland metropolitan area. The program is being managed by the area's Metropolitan Transportation Commission (MTC). The program, initiated in 1972, is expected to be completed in 1978. Projects are being prepared by consulting firms, universities, research institutions, and public agencies working under contract with MTC and, in some cases, by MTC itself.

The BART Impact Program has been designed to cover the entire range of possible impacts associated with the construction and operation of the BART system. Six major project areas have served to organize evaluation of BART's impacts:

- Transportation System and Travel Behavior.
- Land Use and Urban Development.
- Economics and Finance.
- Environment.
- Public Policy.
- Institutions and Lifestyles.



Additionally, three special projects have been established to integrate the findings of the major project studies in order to focus on the important implications of the BART experience:

- Implications for the Transportation Disadvantaged.
- Federal Policy Implications.
- Local Policy Implications.

### Implications for the Transportation Disadvantaged Project (ITD)

#### PURPOSE OF ITD PROJECT

The overall purpose of the Implications for the Transportation Disadvantaged Project has been to provide group-specific evaluation of the range of BART impacts studied in the BART Impact Program. The ITD study has been organized to address certain key questions about the effects of BART's construction and operations:\*

- What impacts have occurred?
- Where are they occurring?
- Who is affected?
- Are the disadvantaged disproportionately affected?

#### SPECIAL POPULATION GROUPS STUDIED

In Phase I of the ITD Project, consideration was given to the question of which population groups constitute the transportation disadvantaged.\*\* The conclusion of this study was that only a tenuous case can be made that all members of any general population subgroup can be considered transportation

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\* Urban Dynamics Associates. Project Implementation Plan: Implications for the Transportation Disadvantaged Project. BART Impact Program. Document No. DOT-BIP-PD 30-10-77. November, 1977.

\*\* McGuire, Chester. Who Are the Transportation Disadvantaged? BART Impact Program. Document No. WP 27-10-77. Prepared for the Metropolitan Transportation Commission, Berkeley, California. April, 1976.

disadvantaged solely by virtue of their membership in that group. However, since as a group — the poor, the elderly, ethnic minorities, women and youth evidence certain general disadvantages vis a vis society, or specific mobility-related disadvantages, these groups represent a special concern in transportation planning.

In order to provide a reasonable scope for the study, it was determined in Phase I that the focus of the ITD Project should be restricted to ethnic minorities, the elderly and handicapped.\* The impacts of a new rapid rail transportation facility are of interest for these groups for similar, but somewhat distinct reasons. All three groups are typically characterized by lower income levels than the general population. Additionally, the reason to study BART's impacts on elderly and handicapped is their impaired mobility due to physical or other disabilities. Ethnic minorities are of special interest for the evaluation of a major public investment in terms of equity considerations, and because differences in culture, lifestyles, and economic status may influence the ways in which they are affected by impacts, perceive or respond to BART's facilities, operation, policies, financing and other effects.\*\* Additionally, since BART was primarily designed to serve long distance travel from outlying sections of the Bay Area, an overall concern is the extent to which it also serves the special transportation needs of the disadvantaged population which is more likely to reside in the central cities of the region.

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\* McGuire, Chester. Implications for the Transportation Disadvantaged: Research Plan. BART Impact Program. Document No. DOT-BIP-PD 28-10-77. Metropolitan Transportation Commission, Berkeley. April, 1976.

\*\* McGuire, Chester. The Special Study of Ethnic Minorities in the BART Impact Program. Document Number DOT-BIP-WP 28-10-77. April, 1976.



## Ethnic Minorities

The ethnic groups studied in the ITD Project are those which make up the three principal minority populations of the San Francisco Bay Area:

- Blacks,
- Spanish-heritage, and
- Asians (Chinese, Japanese and Filipinos).

Other minority groups are represented to a significantly lesser extent in the Bay Area population and include other orientals (e.g. Korean, Vietnamese) and Native Americans. Where data are available, persons in these groups are included in the analysis of BART impacts on the total minority population of the Bay Area. It has been an objective of the ITD Project to apply consistent definitions of specific ethnic minority groups in all analyses of BART's impacts. However, due to variations in the classification of data found in the many information sources used in the study, this has not always been possible and is noted in the discussion of specific impact analyses.

## Elderly

The elderly population is defined to be those persons 65 years of age or older. This transportation disadvantaged group is of particular interest due to generally low-fixed annual incomes and high incidence of mobility impairing disabilities. It is estimated that over sixty-five percent of the non-institutionalized handicapped population in the United States are 65 years of age or older.\*

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\* McGuire, Chester. Who Are the Transportation Disadvantaged? - BART Impact Program. Document No. WP 27-10-77. Prepared for the Metropolitan Transportation Commission, Berkeley, California. April, 1976. Source: U.S. Department of Health, Education and Welfare, National Center for Health Statistics. 1969, Series 10, No. 78, December, 1972.

## Handicapped

The ITD study's focus on the handicapped population is for those individuals with physical, mental or emotional disabilities which restrict or preclude use of conventional private or public transportation facilities. These include:

- Non-ambulatory disabilities,
- Semi-ambulatory disabilities,
- Functional disabilities,
- Sight and Hearing disabilities, and
- Developmental disabilities.

For the severely handicapped individual, there are often numerous problems in addition to the specific handicap itself: advanced age, low income, and lack of specific work skills or education.

## SCOPE OF ITD PROJECT

Analyses of BART's impacts conducted in each of the six major project areas of the BART Impact Program are applied in the investigation of a set of twenty-four specified issues related to a range of potential impacts of BART on the transportation disadvantaged. Issue investigations are being conducted in four broad impact areas; an interim technical memorandum or working paper is to be prepared reporting the results of study in each work element of the ITD study:\*

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\* Urban Dynamics Associates. Implications of BART's Environmental Impacts for the Transportation Disadvantaged. BART Impact Program. Document No. DOT-BIP-TM 34-10-78. Metropolitan Transportation Commission, Berkeley. January, 1978.

Urban Dynamics Associates. Implications of BART's Mobility and Accessibility Impacts for the Transportation Disadvantaged. BART Impact Program. (Draft Technical Memorandum). Metropolitan Transportation Commission, Berkeley. December, 1977.

Urban Dynamics Associates. Implications of BART's Economic, Employment and Financial Impacts for the Transportation Disadvantaged. BART Impact Program. (Draft Technical Memorandum). Metropolitan Transportation Commission, Berkeley. December, 1977.

Urban Dynamics Associates. Implications of BART's Land Use and Urban Development Impacts for the Transportation Disadvantaged. BART Impact Program. (Working Paper). Metropolitan Transportation Commission, Berkeley. January 1978.



- Environmental
- Mobility and Accessibility
- Economic, Employment and Financial
- Land Use and Urban Development.

### Purpose of This Report

This is the third of four interim ITD reports examining the range of BART's impacts on the transportation disadvantaged. The overall objective of this report is to assess the extent of economic related benefit and burden which BART has provided these groups, and to determine if these impacts affect the transportation disadvantaged disproportionately.

It is also the purpose of this report to identify the implications of the economic, employment and financial impacts of BART for the transportation disadvantaged. In order to draw these implications, a set of specific issue statements is examined using the best current information available from the BART Impact Program. During Phase I of the ITD study, a number of economic issues were considered for inclusion within this report. After considerable review of completed and soon to be completed tasks within the six BIP project areas, a list of key economic issues ~~was developed~~, and ~~is~~ employed in this report as the focus of analysis. These seven issues are investigated in Chapter II: "Investigation of Economic, Employment and Financial Issues".

## II. INVESTIGATION OF ECONOMIC, EMPLOYMENT AND FINANCIAL IMPACT ISSUES

In order to determine the implications of the economic, employment and financial impacts of BART for the transportation disadvantaged, seven specific issues have been designated for investigation using information developed in the BART Impact Program; other BART studies; and primary population, employment and travel data sources where necessary.\* The seven economic issues examined are:

1. Does BART provide increased opportunity of employment for minority central city residents by increasing accessibility to outlying suburban office, commercial and industrial areas?
2. Is BART a catalyst for minority business enterprises and minority employment in and around the stations?
3. Have disruptions due to BART construction been a hardship to minority businesses, especially in the Mission area of San Francisco?\*\*
4. What has been the level and significance of BART's direct employment for minorities?
5. Has BART lead to higher property taxes around stations, which in turn, force out ethnic minorities and the elderly?
6. Has BART's financing plan implied a disproportionate burden for low income persons, e.g. ethnic minorities, handicapped and the elderly?
7. Is BART's fare policy inequitable in terms of user cost per mile, and if so, does this affect ethnic minorities to a greater degree than the general population?

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\*Urban Dynamics Associates: Project Implementation Plan: BART's Implications for the Transportation Disadvantaged. September, 1977.

\*\*The Land Use and Urban Development Project currently plans to complete impact assessment of inputs for this issue after the ITD Final Report has been prepared. It is uncertain at this time whether partially completed LUUD impact analysis will be sufficient to interpret this issue in the Final Report. This issue is not evaluated in this report.



## ISSUE NUMBER ONE

Does BART provide increased opportunity of employment for minority central city residents by increasing accessibility to outlying suburban office, commercial and industrial areas?

The extent to which BART has increased employment opportunities for central city ethnic minority residents in the outlying and rapidly growing employment areas of the region is related to the level of increased accessibility provided by BART for the reverse commute work trip. Actual use of BART for this type of work trip is an important measure of the relative significance of accessibility gains which BART has provided in light of other potential factors affecting central city minority employment in suburban areas — level and nature of labor market demand, discriminatory hiring practices, etc. Thus, BART's impacts on employment opportunities in outlying office, commercial and industrial areas is related to both accessibility (potential) and mobility (observed) effects.

### BART's Impact on Accessibility to Outlying Employment Centers

In Work Element 3.2: Mobility Issues of the Implications for the Transportation Disadvantaged Project, BART's impacts on improved accessibility to employment centers for the ethnic minority population of the Bay Area were examined.\* That analysis was based on the work of the Transportation Systems and Travel Behavior Project (TSTB)\*\* which focused on average peak period travel times from the 239 zones constituting the Greater BART Service Area (GBS)\*\*\* to a set of 50 zones representing the

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\*Urban Dynamics Associates. Implications of BART's Mobility and Accessibility Impacts for the Transportation Disadvantaged. BART Impact Program. (Draft Technical Memorandum). Metropolitan Transportation Commission, Berkeley. December, 1977.

\*\*Peat, Marwick, Mitchell & Co. Comparison of Travel Times from With-BART, No-BART and Highway Networks. (Working Note: Work Element VI-2). October, 1977.

\*\*\*San Francisco, Alameda, and Contra Costa Counties and the northern portion of San Mateo County.

locations of major employment opportunities.\* Differences in average travel times to these employment zones were compared among three alternative networks:

- With-BART Transit Network:

A representation of the entire 1976 transit system including BART, its bus feeder services, and all other bus and street-car services in the area.

- No-BART Transit Alternative (NBA):

A representation of a hypothetical 1976 transit system, which has been selected by MTC for comparative analytic purposes and judged to be the most likely to have developed in the BART area if BART had not been built. It represents a transit system providing a much lower level of transit service than the With-BART network.

- Highway Network:

Representation of the 1976 street and highway system using minimum time path morning peak period estimated travel times between all zones in the GBS.

Accessibility gains provided by BART were analyzed in WE 3.2 in terms of the difference in average transit travel times between the With-BART transit network and the No-BART Alternative (NBA).

The conclusion of the analysis in WE 3.2 is that the greatest percentage improvements in average transit travel times resulting from BART are from outlying suburban zones to the downtown areas of San Francisco, Oakland and Berkeley. Since the ethnic minority communities of the Bay Area generally live in the closer-in areas of the region, which are better served by conventional transit, BART-related accessibility gains for ethnic minorities to downtown employment centers have been less than for the general population. On the other hand, it may follow that accessibility improvements (percentage difference in transit travel times) comparable to suburban-to-CBD gains have been provided by BART for travel from central areas to outlying station areas. This potential

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\* The 50 zones of the GBS with the highest "total employment" as estimated by ABAG: Provisional Series Three Projections. March, 1977.



impact would benefit ethnic minorities seeking work or actually employed in the outlying areas.

The hypothesis that BART has provided significant accessibility gains for central area residents to outlying employment areas has not been directly tested in the TSTB Project. Several factors related to the constraints inherent in the accessibility modeling methods utilized in the TSTB Project probably make such a technical analysis infeasible.

- Accessibility analysis methods were designed to examine regional scale impacts. A "few-to-few" zonal analysis would be unreliable due to anomalies in estimated inter-zonal travel times which are averaged out in the more aggregative analyses conducted in the TSTB Project.
- The outlying zones in the top 50 employment zones are relatively large and thus estimated intra-zonal travel times are the least reliable for this subset of employment zones.
- Because a significant number of outlying zones are not provided with transit service in the NBA, the special problem of disconnected zones would be a major obstacle in such an analysis.

Without the benefit of analytic modeling techniques, the extent of BART's impacts on accessibility to outlying employment opportunities for central city residents may still be suggested. Perhaps most importantly, it should be recognized that even where BART-related accessibility gains have been the greatest, suburban residence-to-downtown employment sites, estimated travel time savings have been relatively modest. For the outbound BART commute, average total trip travel time savings are probably less than for the inbound direction due to differences in central area and suburban area access and egress characteristics. These include closer proximity of BART stations to work sites in the downtown areas making walking from the station feasible, and greater provision of parking spaces for auto access in outlying areas with generally lower levels of egress-related bus service to work sites. On the other hand, the With-BART transit network does provide transit service to some outlying employment areas from central city areas which are not served in the No-BART Alternative. Thus, while it

is not possible to conclude that significant improvement in overall accessibility to outlying employment opportunities for central city ethnic minorities has resulted with BART's operations, it is clear that accessibility gains to some suburban job opportunities have been provided by BART for some inner-city residents.

Given this conclusion, the question remains to what extent does BART effect potential job choices for unemployed or underemployed central city residents. The Land Use and Urban Development Project has studied BART's effect on workers' location decisions, however, this study does not address this special case of job search or workplace selection in outlying areas since the sample analyzed was drawn from seven downtown workplace intercept locations. For this sample, one-half of which were BART users, BART was found to be one of several important factors in job location decisions and job search. Without additional study it is not possible to conclude that BART is equally important for workers or job-seekers in outlying areas.

#### BART Work Trips By Ethnic Minorities to Outlying Areas

Some indication of the extent of work travel by central area ethnic minority residents to outlying employment areas is provided by data collected in a survey of employees working in the subregional portion of the BART service area which contains those workplaces that are readily accessible to BART.\* The 88 employment zones served by BART were divided into seven workplace (destination) corridors. Similarly, the 132 zones of the Primary BART Service Area\*\* were divided into five home (origin) areas. Employee and work-trip characteristics were analyzed in the study using these aggregations of zones in order to analyze BART's impacts on regional work-related travel. Within the total workplace study area, it is estimated that there are 505,977 employees from which a sample of 8,391 usable surveys were obtained for the analysis of travel characteristics.

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\* Peat, Marwick, Mitchell & Co. Analysis of 1977 Workplace Survey. BART Impact Program. (Draft Working Note). Metropolitan Transportation Commission, Berkeley. December, 1977.

\*\* PBS: The set of zones which represent a catchment area in which over 80 percent of all BART trips originate.



The results of this study clearly indicate that the total volume of work trips from the central areas of San Francisco to the outlying areas of the East Bay is negligible. Out of a total 81,149 work trip origins from the entire Daly City home area (including the terminus catchment areas in the southwestern part of San Francisco and north San Mateo County) only 258 work trips are to zones within the Richmond workplace corridor which includes all of the City of Oakland, excluding the CBD. Only 183 work trips are made to zones within the Concord workplace corridor and 857 to zones within the Fremont workplace corridor. It is estimated that only 131 of the work trips from the Daly City home area to these outlying East Bay workplace corridors are made on BART.

In the East Bay, there is indication that reverse-commuting from the Oakland home area, which includes the CBD, to outlying employment is more significant. Of the total 39,329 work trips originating in Oakland, 4,018 are restricted to locations within the Richmond workplace corridor, 508 within the Concord workplace corridor and 8,857 within the Fremont workplace corridor. BART's share of work travel from Oakland to the Richmond and Concord Corridors is minimal, 376 and 101 trips respectively; but its share of work travel to workplaces in the Fremont corridor is relatively great, 1,333 trips (15% of all modes). As shown in Table 1-1, more than one-third of the work trips of Black Oakland residents are to the Fremont workplace corridor (37.3%). This represents an estimated 3,866 employees. Similarly, the Fremont workplace corridor is the most frequent work trip destination for Oakland residents identifying themselves as Spanish-heritage who work in the Fremont workplace corridor. For both Black and Spanish-heritage Oakland residents working in the Fremont workplace corridor, BART's share of travel is around 20 percent of all modes, and either greater or equal to AC Transit's share. For both ethnic subgroups, BART's share of total transit travel to this corridor is greater than it is for travel to the downtown workplace areas of San Francisco or Oakland. However, the Fremont corridor is very large as delineated for this analysis and the proportion of these work trips which actually represent commuting to "outlying" workplaces is certainly less than total work travel to this destination workplace corridor.

Table 1-1

EMPLOYMENT LEVELS AND PRINCIPLE MODE OF TRAVEL BY ETHNIC CATEGORY:  
FROM OAKLAND HOME AREA TO SELECTED WORKPLACE CORRIDORS

	Downtown Workplace Areas		East Bay Workplace Corridors (Non-Oakland CBD)		
	San Francisco CBD	Oakland CBD	Richmond <sup>c</sup>	Concord	Fremont
White (N=18,565)	(13.7%) <sup>a</sup>	(33.5%)	(10.7%)	(1.6%)	(14.3%)
BART	14.3% <sup>b</sup>	8.7%	3.7%	25.6%	7.6%
Other Transit	47.5	33.6	11.3	0.0	3.6
Auto	38.2	38.6	62.6	74.4	88.8
Black (N=10,381)	(11.0%)	(19.5%)	(13.6%)	(1.8%)	(37.3%)
BART	34.8%	11.9%	0.0%	0.0%	19.6%
Other Transit	31.6	22.0	3.7	0.0	6.6
Auto	33.6	47.4	91.8	100.0	69.4
Spanish-heritage (N=2,320)	(12.8%)	(32.7%)	(2.5%)	(0.0%)	(39.1%)
BART	16.6%	0.0%	--	--	20.8%
Other Transit	34.1	20.5	--	--	22.0
Auto	49.7	42.3	--	--	50.2
Asian (N=5,230)	(14.0%)	(54.6%)	(2.0%)	(0.0%)	(16.9%)
BART	14.2%	6.9%	--	--	0.0%
Other Transit	34.6	17.9	--	--	21.3
Auto	51.1	44.8	--	--	78.7

<sup>a</sup> ( ) indicates percent of all work travel represented by specific ethnic group from Oakland home area to each of selected destination workplace corridors.

<sup>b</sup> Indicates percent of work travel made by ethnic group represented by mode of travel. Column does not add up to 100% since "other" modes are not shown.

<sup>c</sup> Includes all of Oakland home area excluding Oakland CBD.

Source: Urban Dynamics Associates. Metropolitan Transportation Commission. Tabulation of Workplace Survey File. Creation Date, October 25, 1977. Peat, Marwick, Mitchell and Company, Inc.



## Conclusion

Analysis of BART's overall impact on transit accessibility to employment locations in the Bay Area, has shown that while BART's impact has been modest (average 5 minute travel time savings to the top 50 employment zones from all zones in the Greater BART Service Area), the largest accessibility gains have been from outlying residential areas to downtown workplaces in San Francisco, Oakland and Berkeley. Accessibility modeling analyses conducted in the BART Impact Program have not permitted the testing of the proposition that accessibility gains from central residential areas to outlying employment areas may be comparable to suburban-to-CBD average accessibility gains. BART has provided transit service to some outlying areas which are not served in the No-BART Alternative. But generally, stations access to workplaces in outlying areas is poor both in terms of walking distance and egress-related bus service. Where outlying stations do provide good access to workplaces, it may be concluded that BART has provided increases in accessibility to some outlying employment opportunities for some central area minority residents.

However, based on analysis of the work travel patterns of ethnic minorities living in the Daly City corridor in San Francisco and those living in Oakland in the East Bay, the actual volume of commute trips to outlying employment centers appears negligible, by any mode including BART, except for work travel from Oakland to workplaces within the Fremont corridor. More Black and Spanish-heritage Oakland residents work at employment sites within this corridor than in any other work zone area in the region. Additionally, BART's share of these commute trips is relatively high. However, because of the level of zonal-aggregation in the analysis of home to workplace area trip patterns, it is unclear what share of the reverse commute trips to this corridor represent travel to outlying workplaces. More generally, the BART Impact Program has not developed the type of data necessary to fully evaluate this issue. However, based on the best available information, it does not appear that BART, as of yet, has had a major impact on the access of central city minority residents to outlying employment opportunities.

## ISSUE NUMBER TWO

Is BART a catalyst for minority business enterprises and minority employment in and around the stations?

This issue relates to BART's potential land use impacts around station areas — either as a direct result of increases in retail and service demand associated with greater activity levels within areas where BART stations have been located, or as a result of supporting public land use policies indirectly related to BART. The location of a station might generate substantial increases in localized pedestrian and vehicular circulation, thereby increasing the market exposure of businesses within the area. Additionally, proximity to the BART station could provide businesses within the station areas with greater exposure to regional consumers as a result of improved transit accessibility. Station site land use policies could also support commercial activity related to access to BART through zoning or redevelopment policies. Of special interest for the ethnic minorities of the Bay Area, is the extent to which these conditions have occurred around stations located in the central areas of the urban area where minorities live in the greatest concentrations.

### Limitations of the Analysis

Work Element 8: Employers' Locational Decisions and Work Element 9: Retail Sales and Services of the Land Use and Urban Development (LU & UD) Project of the BART Impact Program will provide analyses of BART's impacts which are most relevant to this issue. The first of these work elements will examine BART's influence on employers' location decision-making process, with special attention to the site choices of firms which are either minority-owned or employ large numbers of minority group workers. The retail sales and services study will also investigate the

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\* John Blayney Associates and David M. Dornbusch & Co., Inc. Study Design and Project Implementation Plan - Phase II, Land Use and Urban Development Project. Document No. DOT-BIP-PD 27-5-77. March, 1977.

locational decisions of retailers with respect to access to BART stations and will evaluate the magnitude of BART's impact on retail sales distribution. The results of both these studies should be available for incorporation in the Final Report of the Implications for the Transportation Disadvantaged Project.

The best currently available information which provides an indication of BART's impacts on business and employment opportunities around stations located in ethnic minority neighborhoods is the LU & UD study focusing on the office construction industry.\* Conclusions drawn from this study are, of course, limited to this single sector of business and employment opportunities for ethnic minorities.

### BART's Impact on Office Construction

It is the conclusion of the LU & UD Project that the overall regional pattern of office construction and rehabilitation has not changed as a result of BART. The redirection of office construction along the Market Street corridor in the San Francisco business district can be indirectly attributed to BART, but BART is only one of a number of factors which have influenced development. Based on interviews with developers, it appears that most of the Market Street intensive office development may have occurred without BART. However, BART's successful bond referendum clearly helped to promote the Market Street Redevelopment Project, which in turn attracted new office development to the downtown areas directly served by BART. Additionally, other public policy BART related incentives for development near BART in downtown San Francisco, such as zoning and transit improvement programming, have supported the continued growth of downtown development.\*\*

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\* John Blayney Associates and David M. Dornbusch & Co., Inc. Study of the Office Construction Industry. Document No. DOT-BIP-WP-12-8-7. (Draft) August, 1977.

\*\* Booz, Allen & Hamilton. The Impact of BART on Land Use and Urban Development Policy. (Draft Working Paper). September, 1977.



The slight growth in office construction, which has occurred in Oakland, has been influenced by a number of factors which tend to obscure BART's effect. In non-downtown station areas, no significant increase in the share of regional office construction has occurred. However, in the case of the Richmond station area, with a resident population of over one-half ethnic minorities, it may be possible to attribute the construction of a building housing the offices of the Social Security System, the new Kaiser Hospital, and plans for an Amtrak Railroad Station to BART and supportive public redevelopment policies.\* It is not known to what extent location of these activities has provided increased employment opportunities for ethnic minorities living near the Richmond BART station.

In the San Francisco Market Street district, BART has significantly influenced, at least indirectly, the character of the station area. Along with the major streetscape changes which have occurred as part of the Market Street Development Project, a significant change in office tenants, employees and clients has occurred. Rents have increased and smaller businesses have undoubtedly been displaced.

Around non-downtown BART stations, in areas with substantial minority populations, not only has no BART-induced change in neighborhood character occurred, but no significant change has been identified in the studies of the LU & UD Project.\*\* Neither Oakland nor the Mission District of San Francisco have experienced marked changes in the demographic profiles of office tenants, employees or customers.

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\* Booz, Allen & Hamilton, Inc. The Impact of BART on Local Transit Service and Financial Policy. (Draft Working Paper) September, 1977.

\*\* Booz, Allen & Hamilton, Inc. The Impact of BART on Local Transit Service and Financial Policy. (Draft Working Paper) September, 1977; John Blayney Associates and David M. Dornbusch & Com. Inc. Study of the Office Construction Industry. Document No. WP-12-8-7. (Draft) August, 1977.

## Minority Business Opportunities within Stations

Opportunities for retail and service business enterprises within BART stations have been fairly limited to date. Telephone, vending machine, locker and other lease arrangements have been provided in BART stations during Phase I of BART's concessions program administered by the Real Estate Department of the BART District. These contracts have been awarded to larger firms, none of which have been minority owned enterprises. \*

On September 22, 1977, the District approved a one year test program which may significantly expand concession opportunities for smaller retail and service enterprises within many BART stations, particularly for minority owned businesses. Permits to operate concessions during this one year evaluation period are to include newsstands, newsracks and vendors, shoe shine, dry cleaner, flower stands, stamp vending and other convenience vending concessions. Six concession permits have been awarded to small businesses, mostly minority owned, in four station areas to date - Daly City, Powell Street, Oakland City Center-12th Street, and Concord. It is estimated that an additional nine will be awarded during the one year evaluation period of the program.

There are a large number of applicants for these permits, and the potential scope of station area enterprises appears to be fairly extensive, if the program proves to be successful in terms of no serious security, maintenance or transportation related problems encountered. If successful, an expanded permanent concession permit program coupled with ongoing affirmative action policies would provide for greater opportunities for minority owned small retail and service businesses within BART stations. These concession permits, while relatively limited in terms of the overall regional distribution of retail and service sales, would represent new opportunities for small minority owned businesses as a direct result of BART, opportunities which would probably not exist in the No-BART alternative (NBA). \*\*

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\* Interview with Roberta Notragelo, Real Estate Analyst, Department of Real Estate. BART District. December 19, 1977.

\*\* For definition of NBA, see Issue No. 1.

## Conclusion

To the extent that BART would increase the accessibility of an area where a station was located, increase pedestrian and vehicular circulation, or stimulate supporting land use policies encouraging commercial and office activities, it could be expected that expanded business and employment opportunities would occur around many BART stations. The results of the Land Use and Urban Development Project of the BART Impact Program to date suggest that these impacts have not occurred to the extent that might have been anticipated. Outside the central business areas of San Francisco and Oakland, where an indirect effect of BART is cited, little change in the character or extent of commercial and office activities has occurred, as of yet, in the BART experience. Within ethnic minority neighborhoods in the older, mixed land use areas of the urban part of the region, generally no major economic impact has been expressed in terms of significant new land use developments. A possible exception to this overall no-impact conclusion, may be the public sector employment opportunities implied by the construction of public facilities planned as part of the redevelopment program around the predominantly Black, downtown Richmond station.

BART has initiated an experimental permit program for concessions within selected station areas, which, if successful and supported by affirmative action policies, will provide new business opportunities for minority owned enterprises that are a direct result of BART and which would probably not exist in the No-BART alternative, the public transportation system judged most likely to have developed if BART had not been built.



### ISSUE NUMBER THREE

Have disruptions due to BART construction been a hardship to minority businesses, especially in the Mission area of San Francisco?

(The investigation of this issue has been deferred until the results of Work Element 12: BART's Construction Impacts on Real Property and Retail Sales of the Land Use and Urban Development Project, are available. This issue may be addressed in the Final Report of the Implications for the Transportation Disadvantaged to be submitted in draft on February 27, 1978, if results of the LU & UD study are available. )

## ISSUE NUMBER FOUR

What has been the level and significance of BART's direct employment for minorities?

One of the potential economic impacts of BART's construction and operating expenditures was to provide for direct employment of ethnic minorities and serve as a catalyst for expanded regional employment opportunities for ethnic minorities. In addition to providing increased total employment for ethnic minorities, a measure of BART's employment impact also includes the extent to which it has increased minority employment opportunities in specific trades, and higher job classifications, provided job skill improvements and has had any indirect or residual effects on regional employment opportunities for ethnic minorities.

### Minority Employment Impacts of BART's Construction

Direct expenditures for the construction of BART accounted for over 30,000 person years of direct employment.\* During the peak year of construction activity, on-site construction employment exceeded 5,000 workers. The heaviest period of construction occurred over the five year period from 1967 to 1971. Despite the relatively large scale of BART's construction program as a single public works project, its overall impact on employment, and particularly on minority employment, is limited by the fact that it represented no more than 6 percent of total construction employment in the San Francisco-Oakland SMSA, even in its heaviest year.

The only data available regarding the ethnic composition of the work force of BART's construction derive from a number of observational surveys of on-site construction work sites at various times during the peak construction period. The validity of

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\* McDonald & Greffe, Inc. The Economic Impacts of BART on Capital and Operating Expenditures. Document No. TM-29-7-77.

the data is indeterminate. In order to assess their reliability, the Economics and Finance Project reviewed these data with union officials and contractors involved with BART's construction. Their informal reaction was that the statistics may overstate minority representation in the construction of BART. Current Equal Opportunity Commission monitoring requirements would result in more reliable measures of direct minority employment impacts for a similar major public expenditure construction project.

By incorporating equal employment standards in construction contracts let by BART, it is estimated that a total minority participation rate of 35 percent was achieved — significantly higher than the 22 percent representation of minority workers in the regional construction work force. Nearly two-thirds of minority workers were Blacks (63%) and about one-third Spanish-heritage (31%). Asian, American Indian and other ethnic minorities were less represented in the total construction work force (6%).

While 35 percent of the work force surveyed were minority workers, 68 percent of these workers were laborers or non-apprenticeable craftsman (usually day work). Excluding laborers from both classifications, only 20 percent of journeyman and only 11 percent of foremen were ethnic minority workers. These data indicate the transitory nature of minority construction employment in stimulating long-term employment potential, since job experience within the laborer category does not necessarily increase future employment opportunities. Thus, the residual effect of BART's relatively high level of total minority employment during its construction phases is uncertain.

On the other hand, BART was effective in achieving a minority participation rate substantially higher than the ethnic profile of the region's construction and trade unions. BART's 35 percent ethnic minority participation rate, compares with a minority representation of only 13 percent in the membership of the referral unions. Table 4-1 shows that BART's construction did not, however, provide for higher representation of ethnic minorities over the union's ethnic profile within skilled worker categories. BART's primary long-term impact on construction employment opportunities for ethnic minorities appears to have been the introduction of the concept of affirmative action or equal employment opportunity to many of the construction trades in the Bay Area.



Table 4-1\*

MINORITY REPRESENTATION OF BART CONSTRUCTION  
WORKERS<sup>1</sup> AND SAN FRANCISCO/OAKLAND UNION MEMBERSHIP

Trade	BART (1967-1971)	Referral Unions S. F. / Oakland SMSA
<u>Summary</u>		
All Members or Workers	100%	100%
Total Minority	35%	13%
<u>Electricians</u>		
All Members or Workers	100%	100%
Total Minority	9%	11%
<u>Plumbers</u>		
All Members or Workers	100%	100%
Total Minority	8%	7%
<u>Carpenters</u>		
All Members or Workers	100%	100%
Total Minority	17%	18%
<u>Laborers</u>		
All Members or Workers	100%	100%
Total Minority	61%	31%

\* McDonald & Grefe, Inc. The Economic Impacts of BART on Capital and Operating Expenditures. Document No. TM-29-7-77.

<sup>1</sup> BART On-Site Construction Work Force Ethnic Data Counts, 1967-1971. (Numbers represent the mean for 1967 through 1971. )

Source: Equal Employment Opportunity Commission, Local Union Report EEO-3, 1969. (An annual survey of referral unions with 100 or more members. )

Table 4-2

COMPARISON OF MINORITY EMPLOYMENT PATTERNS:  
BART, AC TRANSIT AND SAN FRANCISCO MUNI  
OPPORTUNITY BY JOB CATEGORY, 1976\*

Job Category	BART		AC Transit and San Francisco MUNI	
	% Work Force	% Minority of Category	% Work Force	% Minority of Category
Officials/Administrators	16%	30%	3%	15%
Professionals	12	26	5	48
Technicians	3	30	4	40
Protective Services	5	44	3	26
Skilled Crafts	42	41	11	24
Office/Clerical and Para professionals	10	47	11	34
Service/Maintenance	12	43	64	60
TOTALS	100%	40%	100%	49%

\* It should be noted that the reliability of comparisons between agencies is limited by variations in job classification definitions used by the different transit operators.

Source: McDonald & Grefe, Inc. The Economic Impacts of BART on Capital and Operating Expenditures. Document No. TM-29-7-77.

## Minority Employment Impacts of BART's Operation

Total permanent employment by BART was 1,865 in 1976,\* of which 40 percent were ethnic minority employees, a substantially higher percentage than minority representation in the region's population. While BART has achieved a minority participation rate greater than population representation, the total minority employment rate of BART is less than for the older bus systems in the area. Approximately 49 percent of AC Transit and San Francisco MUNI workers are minority employees.

On the other hand, BART appears to have provided for relatively greater employment opportunities at higher job classification levels for its minority employees than is found in the older transit systems in the area. Direct comparison of job classifications between transit agencies is problematic since there exists a wide variation in job category definitions. However, with this caveat, several important comparisons may be made. While in both BART and the other transit agencies, minorities are predominantly employed in operating jobs, as opposed to administrative, there is a substantially greater representation of minorities in the higher job classifications of BART's permanent work force, due in part to the fact that there are more skilled and professional level positions in the BART organizational structure. The actual rate of representation within higher level job classifications is also generally higher at BART for ethnic minorities than it is at AC Transit and San Francisco MUNI. As shown in Table 4-2, ethnic minorities have relatively higher rates of representation in the two largest and higher salary job categories — officials/administrators (30%) and skilled crafts (41%).

Comparison with the No-BART Alternative (NBA) indicates that total employment is greater in the existing With-BART public transit system by approximately 1,300 employees, providing somewhat higher total minority employment.\*\* However, it should be

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\* Equal Employment Opportunity Commission. Local Government Information System, 1976.

\*\* McDonald & Grefe, Inc. The Economic Impacts of BART on Capital and Operating Expenditures. Document No. TM-29-7-77.



remembered that the designated NBA is only one of many possible regional transit systems which might exist without BART, and that it represents a substantially lower level of transit services provided in the region. Since conventional bus and street car systems are more labor-intensive and in the case of the Bay Area have a higher representation of minority employees, a no-BART alternative which provided equivalent levels of transit services would probably have greater impact on minority participation in the area's transit work force than the with-BART system.

BART's adopted equal opportunity employment program and its recent creation of the Affirmative Action and Training Department should continue to improve permanent employment opportunities for ethnic minorities at BART. It is the general assessment of the newly appointed director of this department that the District has made substantial progress in achieving its overall goals for minority improvement, exceeding the established parity goal of 32.6% based on minority representation in the BART district population. \* Current emphasis is on correcting continuing imbalances in the representation of women and minorities in executive and supervisory positions.

### Conclusion

The transit industry has historically been an active employer of ethnic minorities in the Bay Area. The representation of ethnic minority workers in the AC Transit and San Francisco MUNI work force is approximately 49 percent, and 40 percent in the BART work force. Both of these are significantly higher than the proportion of ethnic minority persons in the BART District population which is 32.6 percent. During its peak construction period from 1967 to 1971, as many as 35 percent of the construction work force were ethnic minority workers. The long-term potential impact of BART's construction hiring for improved ethnic minority employment opportunities may have been relatively small since minorities were underrepresented in supervisory and skilled job

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\* Ernest G. Howard, Director of AAT, BARTD. "Affirmative Action Program Origin and Development." Inter-Office Communications. April 20, 1977.

categories, while predominantly employed in laborer jobs with the smallest job advancement potential. However, BART has provided permanent ethnic minority employees with generally higher level job opportunities than are found in the older transit agencies of the region. In comparison to the No-BART Alternative, total ethnic minority employment in the transit sector of the Bay Area is only somewhat higher With-BART. However, the With-BART system is characterized by greater opportunities for minorities in higher income and job classification levels than in the No-BART Alternative.

## ISSUE NUMBER FIVE

Has BART lead to higher property taxes around stations, which in turn, force out ethnic minorities and the elderly?

### Expectations

This issue relates to the expectation that the location of a BART station within existing built-up urban areas would induce greater residential densities and/or encourage higher land use development in general, including office, retail or manufacturing uses. As a result of a combination of land use planning policies and market forces responding to BART's implied accessibility improvements, initial expectations were that substantial land use changes and property value impacts would occur around stations. Reevaluations of assessed property in BART station areas would be based on perceived increases in market value as a result of actual increased development demand, real estate speculation, or some "premium" value seen to be associated with property adjacent to stations. Increases in property taxes resulting from such reassessments might then be great enough to impose a significant burden on lower-income homeowners and renters, of which a large number are ethnic minorities or elderly. This impact would primarily affect lower-income renters who would receive no benefit from the appreciation of real market value of their residences, but would be required to pay higher rents as a result of property owners' shifting the additional tax burden to tenants.

### Limitations of the Analysis

The most relevant source of information to the investigation of this issue is Work Element 13: "Study of Property Values and Rents" of the Land Use and Urban Development Project (LU & UD) of the BART Impact Program. \* The objectives of this

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\* John Blayney Associates and David M. Dornbusch & Company, Inc. BART's Impacts on Property Values and Rents. Working Paper. Submission date: May 13, 1978.



element of the LU & UD Project are to 1) determine BART's impacts on property values and rents; 2) to synthesize and interpret the findings to determine the effect of property value and rent changes on the population distribution of the Bay Area. Assessors' and recorders' files will be analyzed for changes in property valuations within areas surrounding BART stations. Since the results of this study are not available at the time of preparation of this report, analysis of this issue relies on the best available indicators of BART's impacts on property values — the observed extent of overall construction activities within BART station areas, and the findings of the studies of BART's impacts on office and housing location and development.

### Land Development Changes Around BART Stations

Based on comparative analysis of aerial photographs taken in 1965 and 1977 and other data, the Land Use and Urban Development Project has identified land use changes which have occurred in the immediate vicinity (within 1,500 feet) and in the larger area around BART stations (4,000 feet by 4,000 feet square area centered on each station). \*

At this point in the LU & UD Project, no attempt has been made to determine whether BART has either directly or indirectly caused any of these changes. However, to the extent that the land use changes around BART stations have not been significant or have been less than in other parts of the Bay Area, it may be tentatively concluded that BART has not induced the intensity of land use development that would dramatically increase real property values or taxes on assessed valuation around most stations.

Table 5-1 shows the number and type of new land use developments which occurred between 1965 and 1977 around BART stations located in the 1) downtown areas of San Francisco, Oakland and Berkeley; 2) areas of low ethnic minority concentration; and 3) areas of high ethnic minority concentration. These data indicate that with the

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\* John Blayney Associates and David Dornbusch and Company, Inc.  
Station Area Land Use. Document No. DOT-BIP-WP 39-5-77.  
November, 1977.

Table 5-1

STATION AREA CONSTRUCTION: 1965-1977  
DOWNTOWN, HIGH AND LOW ETHNIC MINORITY  
STATION AREA

		Total Number of New Buildings and Facilities		
		Within 1, 500 ft.	Balance of Station Area	Total Station Area
DOWNTOWN STATIONS	<u>Downtown Station Areas</u>			
	* 12th Street/Oakland	34	10	44
	* Montgomery	14	12	26
	* Embarcadero	29	2	31
	Berkeley	23	10	33
	19th Street/Oakland	36	16	52
	Civic Center	13	14	27
	Powell	22	11	33
		<u>171</u>	<u>75</u>	<u>246</u>
	Average Per Station Per Year	2.04	.89	2.93
NON-DOWNTOWN STATIONS	<u>Station Areas with Low Concentrations of Total Ethnic Minori- ties<sup>a</sup></u>			
	Concord	18	41	59
	Pleasant Hill	23	52	75
	Walnut Creek	63	52	115
	Lafayette	16	9	25
	Orinda	9	6	15
	Rockridge	12	2	14
	El Cerrito del Norte	67	152	219
	El Cerrito Plaza	13	6	19
	Fremont	21	18	39
	South Hayward	209	33	242
	Bay Fair	12	11	23
	San Leandro	13	18	31
		<u>476</u>	<u>398</u>	<u>874</u>
	Average Per Station Per Year	3.31	2.76	6.07

(Continued)

Table 5-1 (continued)

	Total Number of New Buildings and Facilities		
	Within 1, 500 ft.	Balance of Station Area	Total Station Area
<u>Station Areas with High Concentrations of Total Ethnic Minorities</u>			
Richmond	22	7	29
North Berkeley	2	-	2
Ashby	17	11	28
Union City	11	92	103
Hayward	14	7	21
Coliseum	6	17	23
Fruitvale	33	14	47
Lake Merritt	26	23	49
MacArthur	25	24	49
Oakland West	26	19	45
Daly City	11	7	18
Balboa Park	16	8	24
Glen Park	54	50	104
24th Street/ Mission	22	5	27
16th Street/ Mission	17	5	22
	<u>302</u>	<u>289</u>	<u>591</u>
Average Per Station Per Year	1. 68	1. 61	3. 28

\* High concentrations of Ethnic Minorities; i.e. greater than 40 percent of total station area population within one-half mile.

<sup>a</sup> Total ethnic minority population of less than forty percent population within one-half mile of BART station. 1970 U.S. Census of Population. McGuire, Chester. Who Are the Transportation Disadvantaged? Working Paper. April, 1976.

Source: John Blayney Associates. Based on 1965 and 1977 aerial photographs taken of a 4,000 feet by 4,000 feet square area centered on each BART station. John Blayney Associates and David M. Dornbusch & Co., Inc. Station Area Land Use. Working Paper. November, 1977. (Revised Table December, 1977.)



exception of a few station areas, Union City, Walnut Creek, El Cerrito del Norte and South Hayward, relatively little construction has occurred around station areas located outside the downtown areas of the region. Three of these four exceptions are all located in suburban areas with predominantly low ethnic minority populations.\* The average number per station area of new buildings or facilities constructed per year is only 3.28 in areas of high ethnic minority concentration, compared to 6.07 in areas of low minority concentration. The record of actual construction activity outside the downtown areas suggests that substantial land use changes resulting in higher use categories and values, have not occurred to the extent that may have been expected around BART stations located within the built-up urban areas where large ethnic minority populations are found.

The relatively small number of units of new construction which are shown for downtown station areas greatly understates the land use and real estate value impacts associated with the extensive high-rise office construction which has occurred during this twelve year period. Three of the seven downtown station areas had concentrations of ethnic minorities exceeding 40 percent of the 1970 population living within one-half mile of a BART station. These impacts have clearly affected downtown minority residents, however, BART's role in the development which has occurred is not clear.\*\*

#### BART's Impact on Housing

Increased assessed valuation of residential property would be most directly related to BART's potential inducement of higher density new housing construction or increased rehabilitation of the existing housing stock around station areas. The findings of the LU & UD Project study of BART's impacts on the housing industry of the Bay Area are relevant in this context.\*\*\* Hypotheses tested in this

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\* Union City is classified as a station area with high ethnic minority concentration in the ITD Project, however, total population around this suburban station is very small.

\*\* See Issue Number 2 for more discussion of BART's impacts on downtown office construction.

\*\*\* John Blayney Associates and David M. Dornbusch & Company, Inc. Study of the Housing Industry. Document No. WP-37-5-77. (Draft). September, 1977.

study are related to either the potential direct impacts of BART on development market demand, or indirect impacts on development potentials operating through BART-related public policy, regulations, or redevelopment programs.

The Land Use and Urban Development Project has found that the apartment market remains strongly automobile oriented and does not recognize access to transit facilities as a premium amenity. As a result, BART has not induced residential construction at a higher density around station areas than would have occurred without BART. The high ethnic minority areas around the Fruitvale, Daly City, Richmond, Mission and West Oakland stations have experienced only a few isolated cases of residential construction. These have not constituted higher density residential developments resulting from BART.

Rezoning to permit higher density residential development around station areas as a result of BART could be expected to raise property owners' expectations and thus inflate land prices. Of the thirty-four BART station areas, land use policy changes between 1965 and 1975 have resulted in less restrictive controls (upzoning) for eighteen station areas, seven of which have high concentrations of ethnic minorities.\* Two of these are CBD station areas. Six of the eight station areas experiencing more restrictive land use policies limiting BART's potential real estate impact are in urban residential areas of high ethnic minority concentration.

The Mission District of San Francisco, with its large Latino population, organized neighborhood opposition, defeated a redevelopment-renewal program and achieved zoning changes which reduced height limits at both the 16th Street and 24th Street stations.\*\* The Mission District experience, is an example of a case in which the

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\* Gruen Associates, Inc. Indirect Environmental Impact. BART Impact Program. Draft TM. Prepared for the Metropolitan Transportation Commission, Berkeley, California. January, 1977.

\*\* Booz, Allen & Hamilton. The Impact of BART on Land Use and Urban Development. (Draft Working Paper). September, 1977. Jefferson Associates, Inc. Impacts of BART on Bay Area Political Institutions. TM 32-6-77. May, 1977.

perceived "external" threat of BART can be seen to have directly stimulated community support and agitation for conservation and anti-development land use control policies. In another case study area of the Land Use and Urban Development Project, it was found that in the Richmond station area, with a large black population concentration, that the limited residential development which has occurred can not be attributed to BART, and that rehabilitation activity is negligible.\*

In the older built-up areas of San Francisco, Oakland and Richmond, rehabilitation activity in neighborhoods adjacent to BART stations is considerably lower than in comparable areas one to three miles away. Because of the mixed land use character of many urban minority neighborhoods, extensive residential rehabilitation would be unlikely, irrespective of BART. In the Mission District and downtown Richmond, rehabilitation loan activity around stations has been one-third the neighborhood average; only one-sixth the areawide average in Oakland's Fruitvale District.

### Conclusion

Increased assessed property valuation of housing in the vicinity of BART stations would imply the heaviest burden on the elderly and lower-income households, many of which are ethnic minorities, living in rental units in low and moderate cost housing. BART's impacts on taxable property could result from either higher development market potential of station areas resulting from perceived increases in accessibility, or from public land use control and redevelopment programs. At this point in the BART Impact Program studies, there is not sufficient evidence to determine if assessed property values have increased substantially around station areas, including those with high concentrations of ethnic minority population subgroups, or that these changes, if they have occurred are related to BART. A definitive conclusion to this issue must

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\* John Blayney Associates and David M. Dornbusch & Company, Inc. Study of the Housing Industry. Document No. WP 37-5-77. (Draft) September, 1977.

Booz, Allen & Hamilton. The Impact of BART on Land Use and Urban Development. (Draft Working Paper). September, 1977.

Jefferson Associates, Inc. Impacts of BART on Bay Area Political Institutions. (Draft TM). May, 1977.



await the findings of the incomplete property value study of the Land Use and Urban Development Project. However, the record of actual construction activities around BART stations, the relatively small impact of BART on housing development and rehabilitation activity suggest that residential property values have not increased substantially around most non-downtown BART stations as a result of BART.

BART's impact on property values is apparently the least in the older, mixed land use urban areas where ethnic minorities live in the greatest concentrations. It is unlikely that subsequent studies will show that significant relocation of lower income tenants has occurred around BART stations as a result of inflation of assessed residential property valuations related to BART's impacts on the development market or land use policies.

Has BART's financing plan implied a disproportionate burden for low income persons, e.g. ethnic minorities, handicapped and the elderly?

### Overview: Financial Costs of BART

The level of financial support for the regional public transportation system in the nine county Bay Area is quite high. Prior to the introduction of BART into the area's transit system, the Bay Area was already providing one of the highest levels of per capita public support for transit of any area in the United States.\* With BART in operation in 1976-77, total local, state and federal transit revenues in these counties represented approximately 56 percent of total statewide transit revenues, with only 25 percent of the state's population. Local per capita support for transit services in the BART Service Area is especially high:\*\*

Alameda County	\$57. 01
Contra Costa County	\$46. 78
San Francisco County	\$99. 69

BART has been a major contributing factor in the high level of funding support provided for the operational expenses of transit services in the Bay Area, not only for local, but for state and federal sources as well.

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\* Booz, Allen & Hamilton, Inc. The Impact of BART on Local Transit Service and Financial Policy. (Draft Working Paper).  
September, 1977.

\*\*1975 Source (Ibid).

The costs of construction of the BART system and purchase of equipment represents an expenditure of more than 1.5 billion dollars. With interest on bonds sold to finance capital expenditures, BART's total cost is estimated to amount to nearly 2.3 billion. At the time, the sale of the 792 million dollar property tax bonds used to finance most of BART's basic system construction was the largest such bond sale ever issued by a local area in the country. By 1969, BART debt averaged about 40 percent of the total debt in Alameda County, 45 percent in Contra Costa County and 75 percent of the debt in San Francisco City and County.\* It is clear that the overall fiscal burden of BART's construction and operations is substantial, particularly in terms of local funding requirements. BART has been a major contributing factor in the high level of funding support provided for the operating expenses of transit services in the Bay Area. BART's operating costs in 1976-1977 were \$66.8 million, or 34.8 percent of total transit expenditures of BART, Alameda-Contra Costa Transit (AC Transit) and San Francisco Municipal Railway (MUNI), (\$191.7 million).\*\*

#### Property and Sales Tax Regressivity and the Transportation Disadvantaged

Property tax and local sales tax revenue sources have constituted major sources of funding for both BART's capital and operational costs. Since both these forms of taxation have been traditionally regarded as regressive methods of public financing, the implications of BART's financing plan for the transportation disadvantaged are of major interest in terms of equity considerations. The established concept is applied in the ITD Project that an "equitable" tax is one which requires at least the same proportion of income from all households; a "regressive" tax is one which requires higher proportions of household income for lower income families and individuals.

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\* Bartle Wells Associates, for McDonald & Grefe, Inc. The Impact of BART's Bond Issue on Regional Public Financing. Document No. DOT-BIP-TM 27-7-77. August, 1977.

\*\* Metropolitan Transportation Commission. Audited 1976-1977 Statements of Operations for San Francisco Bay Area Rapid Transit District, Alameda-Contra Costa Transit District, and San Francisco Municipal Railway.



It has been the general finding of the BIP Economic and Finance Project that the incidence of the tax burden of BART falls disproportionately on low and medium income households in the Bay Area. While no ethnic group-specific tax incidence analysis has been performed in the BART Impact Program, it is clear that the disproportionate burden of local fiscal support which applies to low income families and individuals is especially relevant to the ethnic minority population of the Bay Area. As shown in Table 6-1, substantially more Black and Spanish-heritage minority households are found in the low household income ranges than are other ethnic groups. While 63.9 percent of Black and 49.6 percent of Spanish-heritage families had total annual incomes in 1970 of less than \$10,000, only 36.9 percent of the total other ethnic group category (predominantly White) had incomes in this low range. It is also true that for the elderly population, many are living on low fixed incomes.

#### The Burden of BART's Capital Costs

Funding sources for BART's construction and equipment purchases include local property and retail sales taxes in the three county BART service area, bridge tolls, federal grants and other fund sources. Of the estimated \$2.3 billion total capital cost of BART, approximately three-quarters (75.1%) of the financial support is being provided from local area property and retail sales taxes. Less than fourteen percent (13.8%) of the capital cost of BART, is being financed with federal grants. Today, eighty percent of total capital cost would be eligible for Urban Mass Transportation Administration Section III capital grants assistance funding. Since BART's initial financial plan was developed and construction began prior to the UMTA capital assistance program, a large share of the burden of constructing BART has been assumed by the local area. Thus, the magnitude of BART's capital financing impact on the local taxpayer probably exceeds that which would be applicable in other regions today.

- Incidence of the Burden by Sector

As shown in Table 6-2, the burden of the local share of BART's capital costs falls heaviest on households (65.0%) - considering the incidence of both property and sales taxes. This includes property taxes paid by homeowners, rent increments passed on

Table 6-1

1970 HOUSEHOLD INCOME DISTRIBUTION BY ETHNICITY:  
THREE COUNTY BART SERVICE AREA

	Black	Spanish- Heritage	Others <sup>a</sup>	Total
Under \$5,000	30.2%	17.4%	12.7%	15.3%
\$5,000 to \$6,999	13.7	10.6	7.9	8.9
\$7,000 to \$9,999	<u>20.0</u>	<u>21.6</u>	<u>16.3</u>	<u>17.3</u>
Sub-total (Below \$10,000)	63.9%	49.6%	36.9%	41.5%
\$10,000 to \$14,999	22.8%	29.8%	30.0%	29.1%
\$15,000 to \$24,999	11.7	17.3	25.2	22.7
\$25,000 and over	<u>1.5</u>	<u>3.3</u>	<u>7.9</u>	<u>6.6</u>
	100.0%	100.0%	100.0%	100.0%

<sup>a</sup> Number of all families in each income range minus number of Black and Spanish-heritage families in each. Includes Asians and other ethnic minorities, but is predominantly White.

Source: Urban Dynamics Associates. U.S. Census of Population: 1970. General Social and Economic Characteristics Tables 124, 128 and 133.

to renters by landlords, and consumer purchases of retail goods and services in the BART District. Businesses in the three county BART District will assume about one-quarter (24%) of the burden of BART's capital costs, after considering the portion of taxes which can be shifted to the consumer. The remaining portion (11%) of the local financing burden will be exported to tourists and businesses outside the Bay Area. Within the three county area, there is some variation in the portion of the local burden assumed by each sector, e.g. the household share of property taxes used to finance BART's capital costs is estimated to be 72.5 percent in San Francisco, 61.8 percent in Alameda and 58.4 percent in Contra Costa County.

- Incidence of the Burden by Household Type

Eleven household types illustrating a range of income levels and standards of living have been selected by the Economics and Finance Project to analyze the incidence of the local financial burden of BART's capital costs.\* As shown in Table 6-3, it is estimated that for a family of four, female head of household with a poverty-level income of \$2,362 per year (Group 8), BART's capital cost related tax burden is \$15.63 annually, or .66 percent of total household income. In contrast, for an affluent family of four with an annual income of \$45,715 (Group 10), the total tax burden of BART's capital costs is \$111.31 per year, but only .24 percent of family income - nearly three times less than the poverty-level family. For the elderly individual, living alone with an income of \$4,489 (Group 1) the total tax burden related to BART's construction is estimated to be \$32.90, or .72 percent of annual income.

It is clear from these illustrations of the incidence of property and sales tax burden on various household types, that the heaviest burden is assumed by lower-income households, more likely to be ethnic minority households. It is also important to note, that these households bear this burden regardless of the extent to which they use BART.

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\* For a more complete discussion of the methodology used in defining these prototypical households see: McDonald and Greffe, Inc. Definitions of Typical Household Groups for Task 5. Working Note. July, 1976.



Table 6-2

TOTAL BURDEN OF BART'S CAPITAL COSTS  
THE INCIDENCE OF PROPERTY AND SALES TAXES  
1964-1999  
(in Thousands of Current Dollars)

Sector of Three County BART Service Area	Property Tax	Sales Tax	Total	% of Total
Households	\$ 982,989	\$132,252	\$1,115,241	65.0%
Businesses	379,131	36,848	415,979	24.2
Export	168,163	18,800	186,963	10.9
Unallocated	- 1,529	--	- 1,529	0.1
Total	\$1,528,754	\$188,000	\$1,716,754	100.0%

Source: McDonald & Grefe, Inc. Distribution of the Tax Burden of Financing BART's Construction and Operations. BART Impact Program. Document No. DOT-BIP-TM 30-7-77. July, 1977.

Table 6-3

TAX BURDEN OF TYPICAL HOUSEHOLDS  
FOR BART CAPITAL EXPENSES, 1975-1995

Group No.	Income	Household Description	Property Tax	Sales Tax	Total Tax Burden	Tax Burden As Percent of Income
1	\$ 4,489	Individual, lower living standard, over 65, retired	\$22.54	\$ 9.86	\$32.90	0.72%
2	\$10,041	Individual, low-moderate living standard	\$15.98	\$15.97	\$31.95	0.32%
3	\$10,277	Couple, low-moderate living standard	\$34.14	\$16.44	\$50.58	0.49%
4	\$ 6,851	Couple, low-moderate living standard, head over 65	\$24.18	\$14.09	\$38.27	0.56%
5	\$15,711	Couple, moderate living standard	\$35.38	\$21.13	\$56.51	0.36%
6	\$ 8,859	Family of 3, low-moderate living standard	\$34.14	\$16.44	\$50.58	0.57%
7	\$14,411	Family of 3, moderate living standard	\$34.14	\$16.44	\$50.58	0.35%
8	\$ 2,362	Family of 4, poverty-level living standard, female head of household	\$10.93	\$ 4.70	\$15.63	0.66%
9	\$21,735	Family of 4, high living standard	\$40.99	\$29.12	\$70.11	0.32%
10	\$45,715	Family of 4, affluent living standard	\$71.86	\$39.45	\$111.31	0.24%
11	\$18,191	Family of 6, moderate living standard	\$39.90	\$26.38	\$66.28	0.36%

Source: McDonald & Grefe, Inc. Distribution of the Tax Burden of Financing BART's Construction and Operations. BART Impact Program. Document No. DOT-BIP-TM 30-7-77. July, 1977.

## The Burden of BART's Operating Costs

Financial support for the operations of BART include fare revenues, local property and retail sales taxes levied in the three county Bay Area Rapid Transit District (BARTD), and some federal funds. For the Fiscal Year of 1975-76, BART's total operating budget was approximately \$55.9 million, of which about 42 percent (\$23.2 million) was supported by fares. The largest share of the remaining 1975-76 operating deficit was financed by a one-half of one percent tax on retail sales in the BART District.

These sales tax revenues amounted to \$21 million (64.4% of operating deficit). An additional \$5.9 million of operating deficit was funded with revenues from taxes on property in the BART District. Combined, these two sources of local tax support represented more than four-fifths of BART's total operating deficits (82%).

- Incidence of Burden by Sector

Table 6-4 shows the distribution of the final incidence of the local tax burden for BART's operation in 1975-76 by sectors of the three BART county area's economy. Approximately 69 percent of the annual operating deficit supported by local taxes is paid for by household, as homeowners, renters, or consumers. The portion of the operational deficit burden born by business which is not shifted to consumers is estimated to be around 21 percent. Approximately 10 percent of BART's operational deficit is funded with local taxes which are exported to non-residents of the area.

- Incidence of the Burden by Household Type

In order to provide an indicator of the degree of regressivity in the financing of BART's operations, a representative range of household sizes, incomes and age groups were selected for evaluation of BART related local tax incidence.\* Table 6-5 reveals the regressive nature of the methods of financing BART's operations. A pattern of decreasing burden, as a percentage of

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\*See note on Page II-34.



Table 6-4

FINAL INCIDENCE OF OPERATING REVENUES  
BART IMPACT IN FY 1976

(In Thousands of Current Dollars)

	Property Tax	Sales Tax	Total	% of Total
Household	\$3,790	\$14,798	\$18,588	69.0%
Business	1,471	4,120	5,591	20.7
Export	669	2,102	2,771	10.3
Unallocated	- 2	-	- 2	0.0
TOTAL	\$5,928	\$21,020	\$26,948	100.0%

Source: McDonald & Grefe, Inc. Distribution of the Tax Burden of Financing BART's Construction and Operations. BART Impact Program. Document No. DOT-BIP-TM 30-7-77. July, 1977.

Table 6-5

TAX BURDENS OF TYPICAL HOUSEHOLDS  
FOR BART OPERATING EXPENSES, 1975-1995

Group No.	Household Description	Income	Property Tax	Sales Tax	Total Tax Burden	Tax Burden as Percent of Income
1	Individual, lower living standard, over 65 retired	\$ 4,489	\$2.68	\$ 8.30	\$10.98	0.24%
2	Individual, low-moderate living standard	10,041	1.90	13.44	15.34	0.15
3	Couple, low-moderate living standard	10,277	4.06	13.83	17.89	0.17
4	Couple, low-moderate living standard, head over 65	6,851	2.87	11.86	14.73	0.21
5	Couple, moderate living standard	15,711	4.20	17.79	21.99	0.14
6	Family of 3, low-moderate living standard	8,859	4.06	13.83	17.89	0.20
7	Family of 3, moderate living standard	14,411	4.06	13.83	17.89	0.12
8	Family of 4, poverty-level living standard, female head of household	2,362	1.30	3.95	5.25	0.22
9	Family of 4, high living standard	21,735	4.86	24.50	29.36	0.13
10	Family of 4, affluent living standard	45,715	8.53	33.20	41.73	0.09
11	Family of 6, moderate living standard	\$18,191	\$4.70	\$22.20	\$26.90	0.15

Source: McDonald and Grefe, Inc. Distribution of the Tax Burden of Financing BART's Construction and Operations. BART Impact Program. (Draft Document No. DOT-BIP-TM 30-7-77). July, 1977.

household income as household income increases, is illustrated in this table. The greatest relative burden of BART's operational costs is assumed by the elderly individual living on a low income (Group 1). An affluent family of four (Group 10) bears the least of the proportionate burden (.09% of household income). The relative burden born by the poverty-level family of four with female head of household (Group 8, .22% of household income) is more than two and one-half times that of the affluent household. Due to lower income levels found among ethnic minority households a heavier burden of BART's operational costs is implied for the ethnic minority subgroups of the BART District's population.

- Comparison of Funding Sources for Regional Transit Operations

The heavier relative burden of BART's operational costs which falls upon the low income ethnic minority population is the result of the fact that such a large share of the operational deficit of BART is funded with local sales tax revenues which are regressive. On the other hand, it is also true that a major portion of the operating deficits of other Bay Area transit systems are also financed with regressive methods of public revenue generation, primarily local property taxes. Table 6-6 shows the percentage of 1976-77 operating expenses local funding sources represented in the annual operations budget of BART, Alameda-Contra Costa Transit and San Francisco Municipal Railway.

While 63.8 percent of BART's gross operational expenses were paid for by local taxes, the budgets of San Francisco Municipal Railway and Alameda-Contra Costa Transit show a substantially smaller proportion of total operating expenses funded with local taxes — 46.9 percent for San Francisco MUNI and 39.1 percent for AC Transit. All these systems generate roughly equivalent levels of operating revenues as a percentage of total operating expenses (33.3% to 39.2%). Federal, State and other sources of funds are greater for AC Transit (25.6%) and San Francisco MUNI (15.0%) than they are for BART (5.7%). The larger share of federal and state participation in the funding of these system's operations not only represents a higher level of external assistance, it also implies more progressivity of burden since approximately 73 percent of these external funds are UMTA Section V monies which are largely obtained from national income tax revenues.



Table 6-6

ANNUAL 1976-77 OPERATING EXPENSES AND SOURCE  
OF FUNDING: BART, AC-TRANSIT AND SAN FRANCISCO MUNI

	BART	AC-Transit	MUNI
Total Operating Expenses (\$ Millions)	\$66.8	\$53.1	\$71.8
(Percent of Three Systems)	34.8%	27.7%	37.4%
Source of Operating Funds	Percent Total Operating Expenses (Adjusted)		
• Fare and Other Operating Revenue	39.2%	36.8%	33.3%
• Local Property & Sales Tax	63.8%	39.1%	46.9%
— Property	8.3%	39.1%	46.9%
— Sales	47.2%	--	--
• Federal, State and Other	5.7%	25.6%	15.0% <sup>a</sup>
TOTAL Revenues as Percent of Total Operating Expenses	100.4%	101.5%	95.2%

<sup>a</sup> Includes Revenue Sharing Funds (\$5 million).

Source: Metropolitan Transportation Commission. Audited 1976-77 Statements of Operations for San Francisco Bay Area Rapid Transit District, Alameda-Contra Costa Transit District, and San Francisco Municipal Railway.

The important point here is not that new rapid rail systems will necessarily rely on regressive local tax revenues to a greater extent than conventional transit systems, but that where operating revenues fall substantially short of expectations and federal or state operating subsidies are not significant, rapid rail district administrators may have no other choice but to utilize such existing revenue mechanisms. To the extent that regional rapid rail systems may be expected to serve the travel needs of the low-income transportation disadvantaged less than bus systems do, the possibility of equal or greater reliance on regressive tax revenues to finance their operations has important equity implications for transportation planning.

### Conclusion

BART has contributed to a high level of financial support for the total transit system in a region which already had, before BART, one of the highest levels of per capita funding of public transportation in the country. The financing program used to pay for both BART's construction and annual operations has relied heavily on local BART District taxes on property and retail sales. Incidence analysis of the burden of BART shows that 1) area households pay the majority of the local share of BART's costs, and 2) a heavier relative burden falls on low-income families and individuals. Since ethnic minority and elderly households represent a relatively large proportion of low and moderate income groups in the region, a disproportionate burden of BART's financing is borne by these households in terms of higher percentages of income used for local tax support of BART. A heavier burden is assumed by these households regardless of the extent to which they use or do not use BART.

Because of the 1964 enacted UMTA Section III Transit Capital Assistance Grant Program, the burden of financing the construction of a major commuter rail system in another region today would not impose as heavy a burden on local households in general, or the transportation disadvantaged in particular, as it has in the BART experience. Encountering shortfalls in fare revenues, unanticipated and escalating operational costs, BART has relied heavily on regressive local taxes to support operations. Compared to the bus and street-car operators in the BART District, BART's operating revenues

support about the same proportion of total operating costs (about one-third). But the more substantial level of federal and state assistance for bus operations in the Bay Area is associated with lower requirements on local regressive tax sources in their budgets than in BART's operating budget.



## ISSUE NUMBER SEVEN

Is BART's fare policy inequitable in terms of user cost per mile, and if so, does this affect ethnic minorities to a greater degree than the general population?

### Principles of BART's Fare Structure

After an extensive study and review of alternative fare schedules, the District Directors of BARTD adopted the basic Interstation Fare Schedule on December 20, 1971. A number of policy factors were considered relevant to alternative fare structures. The following principles were incorporated into BART's basic fare policy adopted in 1971:\*

- Fare level sufficient to meet revenue "need";
- Fares must be "reasonable" and in line with competition;
- Fares in proportion to value received, distance covered and relative speed of trip;
- Fare structure to maximize ridership from all market segments for given revenue level; and
- All fares determined by application of a general formula as opposed to arbitrary judgements on piecemeal basis.

BARTD adopted an initial fare structure which is a graduated fare schedule based on distance of travel. As compared to a flat fare or modified zone fare system, this structure provides for a more equitable distribution of user fees since travelers must pay for each increment of distance traveled. However, user cost per mile for the longest distance trips (25 + miles) was less than for other BART trips due to a lower per mile fare increment for longer trips.

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\* Office of Research, BARTD. "Memorandum Report on BART Fare Structure." December 13, 1974.

Additionally, a scheduled speed adjustment component was included to compensate for variable travel times on various segments of the system.\* Also, special 75 percent discounted fares for senior citizens and children 12 years of age and younger were established in 1972. Beyond these two transit dependent groups, BARTD did not incorporate special fares to subsidize low income transit users based on the rationale that income-redistribution objectives are generally within the province of other levels of government.\*\*

### Change in Fare Structure

In November, 1975, BARTD reassessed its fare policy and initial fare structure in order to evaluate alternative revised schedules. The overriding objective of this study and the resulting fare changes was to increase total fare revenues while minimizing associated decreases in system patronage levels. Table 7-1 summarizes the changes in components of BARTD's fare structure adopted by the District Directors.

In terms of distance of travel, the overall impact of the fare change was to increase the mileage incremental costs for shorter trips in the 6-14 mile range and to reduce the mileage incremental costs for medium and long distance travel. For the relatively small number of BART trips which are less than 6 miles, the fare remained a \$.30 minimum with provision for a \$.25 fare for CBD trips less than two miles. No change in the scheduled speed component was adopted. Additionally, suburban fare zones were expanded to include a maximum 30 cent fare from Concord to Orinda (13.0 miles), Fremont to Bay Fair (12.8 miles) and Richmond to Ashby (8.6 miles). These changes, which generally favored the longer distance (and higher scheduled speed), trips were offset to some extent by the increase in the transbay surcharge from 15 cents to 25 cents. Also, a 15 cent surcharge on all non-transbay trips originating from the Daly City station was established in

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\* The scheduled speed component is applied to the basic fare determined by trip length, by adding a \$.02 premium per minute saved for trips faster than the system average, and by reducing total fare by \$.02 per extra minute for trips slower than the system average.

\*\* Office of Research, BARTD. "Memorandum Report on BART Fare Policy." December 13, 1974.

Table 7-1

## SUMMARY OF CHANGES IN BART FARE STRUCTURE

User Charge Component	Initial	Current (November 3, 1975)
Minimum Fare for Trips up to 6 miles	\$ .30	\$ .30
CBD Fare (under 2 miles)	—	\$ .25
Suburban Zones <sup>a</sup>	—	\$ .30
Trips 6-14 miles	\$ .35 + \$ .03/mile	\$ .40 + \$ .05/mile
Trips 14-20 miles	\$ .59 + \$ .03/mile	\$ .80 + \$ .02/mile
Trips 20-25 miles	\$ .77 + \$ .03/mile	\$ .92 + \$ .01/mile
Trips over 25 miles	\$ .92 + \$ .01/mile	\$ .97 + \$ .01/mile
Transbay Surcharge	\$ .15	\$ .25 <sup>b</sup>
Daly City Surcharge	\$ .00	\$ .15 <sup>c</sup>
Scheduled Speed Component	+/- \$ .02/mile	+/- \$ .02/mile
Resulting Highest Fare	\$1.25	\$1.45
Average Fare (weighted by expected patronage)	\$ .63	\$ .76
Parking Charges	none	none

<sup>a</sup> Concord to Orinda (13.0 miles); Fremont to Bay Fair (12.8 miles); and Richmond to Ashby (8.6 miles).

<sup>b</sup> Transbay from Richmond line involves transfer and thus surcharge remained at \$ .15.

<sup>c</sup> Does not apply to Transbay trips.

Source: General Manager, BARTD. "Fare Increase and Park Change Proposal." Inter-Office Communication. August 6, 1975.



order to assure greater financial support from the 30 percent of these BART users who live in San Mateo County and do not pay BART taxes. BARTD has also adopted a 75 percent discount fare for handicapped persons and increased the discount fare for the elderly to 90 percent.

In order to gauge the net effect of these changes in the BART fare schedule, Table 7-2 shows the percentage increase in fares for selected trips of varying distances. The weighted-average BART fare increased 20.6 percent, from 63 cents to 76 cents. However, the most substantial percentage fare increases occurred in the shorter and moderate distance trips — 39.0 percent for transbay and 32.3 percent for non-transbay trips of 10 miles in length. Despite the increase in the surcharge for transbay travel, one effect of the fare change has been to increase the cost per mile of shorter distance BART trips to a greater degree than it has for longer distance trips.

#### Fares Structure and Ethnic Minorities

Analysis of BART passenger fare payments show some variation in average fares paid among the ethnic subgroups of BART's ridership:\*

Asian	\$ .69
Black	.55
Spanish-Heritage	.53
White	.76
Other	.72
<u>All Persons</u>	<u>\$ .73</u>

The lower average fares paid by non-White BART riders reflect the fact that BART is not used as extensively by lower-income and ethnic minority travelers for longer rides that have higher fares. These data do not address the equity issue in terms of cost per mile.

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\* BART Passenger Profile Survey, 1976. Daytime total. Responses weighted for sampling ratio and response rate variation. McDonald & Greffe, Inc. Distribution of the Tax Burden of Financing BART's Construction and Operations. (Draft TM). July, 1977.

Table 7-2

EFFECT OF NOVEMBER 3, 1975 FARE STRUCTURE  
CHANGE: SELECTED TRIP LENGTH<sup>a</sup>

Selected Trip Length	Percentage Increase in Regular Fare		
	Daly City Origin	Transbay	Other Non-Transbay
10 miles	+59.6%	+37.1%	+27.7%
15 miles	+32.5 <sup>b</sup>	+39.0	+32.3
20 miles	+16.3	+27.2	+19.5
25 miles	+14.0	+14.0	+ 5.4
35 miles	+ 8.2	+ 8.2	+ 0.0
50 miles	+ 7.3%	+ 7.3%	—

Average Fare - All Trips +20.6%  
(weighted by expected trips)

<sup>a</sup> Scheduled speed component not changed and not included in these fare comparisons.

<sup>b</sup> All trips greater than 14 miles are Transbay trips.

Trip length frequency distributions by ethnic category have not been estimated either for BART travelers or for areawide travelers in general. However, the overall geographic pattern of higher concentrations of ethnic minorities in the more central and closer-in parts of the Bay Area clearly indicate that average home-based travel distances are shorter for the ethnic minority population.\* Typically, shorter areawide travel distances constitute the principal factor underlying the lower gains in accessibility provided by BART for the non-White population.\*\*

Since trip length frequency distributions are not available, the analysis of the equity of BART's fare structure in terms of cost per mile is addressed by examining average fares from non-downtown origin stations to the San Francisco CBD by degree of ethnicity of the population living around each station. For this analysis, the Montgomery Street Station has been selected, since it is the most common destination station for BART travelers — 34.7 percent of total daytime travel from non-downtown areas.\*\*\* The Montgomery Street Station is also the most common destination for each ethnic minority subgroup of BART's ridership from urban and suburban areas.

Asian	40.3%
Black	29.1
Spanish-Heritage	33.7
White	35.4
Other	31.0%

Adult regular fare from all non-downtown origin stations to Montgomery Street have been calculated and the average fare from station areas with high ethnic minority concentrations (40+ %) is compared to the average fare from station areas of low ethnic minority concentration. As shown in Table 7-3, the average fare to Montgomery Street from the 16 high ethnic minority stations is \$.69

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\* Urban Dynamics Associates. ITD Project: Environmental Issues. BART Impact Program. Draft TM. September, 1977.

\*\* PMM & Co. Analysis of BART's Accessibility Impacts. (Working Note). December, 1976.

\*\*\* Passenger Profile Survey 1976. File WX.



Table 7-3

AVERAGE FARE FROM HIGH AND LOW ETHNIC  
POPULATION STATION AREAS TO MONTGOMERY  
STREET TO SAN FRANCISCO CBD STATION<sup>a</sup>

Station Area Category	Average Fare	Average Distance	Average Cost/Mile
(16) High Ethnic Concentra- tion	\$ . 69	10. 8 miles	6. 4¢/mile
(14) Low Ethnic Concentra- tion	\$1. 11	21. 7 miles	5. 1¢ /mile

<sup>a</sup> Unweighted by actual trips.

Source: BARTD. "Mileage and Fare Table." Report T3002. January, 1977.

compared to \$1.11 from the fourteen lower ethnic minority station areas. The impact of BART's decreasing marginal user costs for mileage increment is illustrated by the observation that the average fare per mile from the stations in areas of high ethnic minority concentration is 6.4 cents per mile compared to 5.1 cents per mile from stations of low ethnic minority population — 25 percent higher.

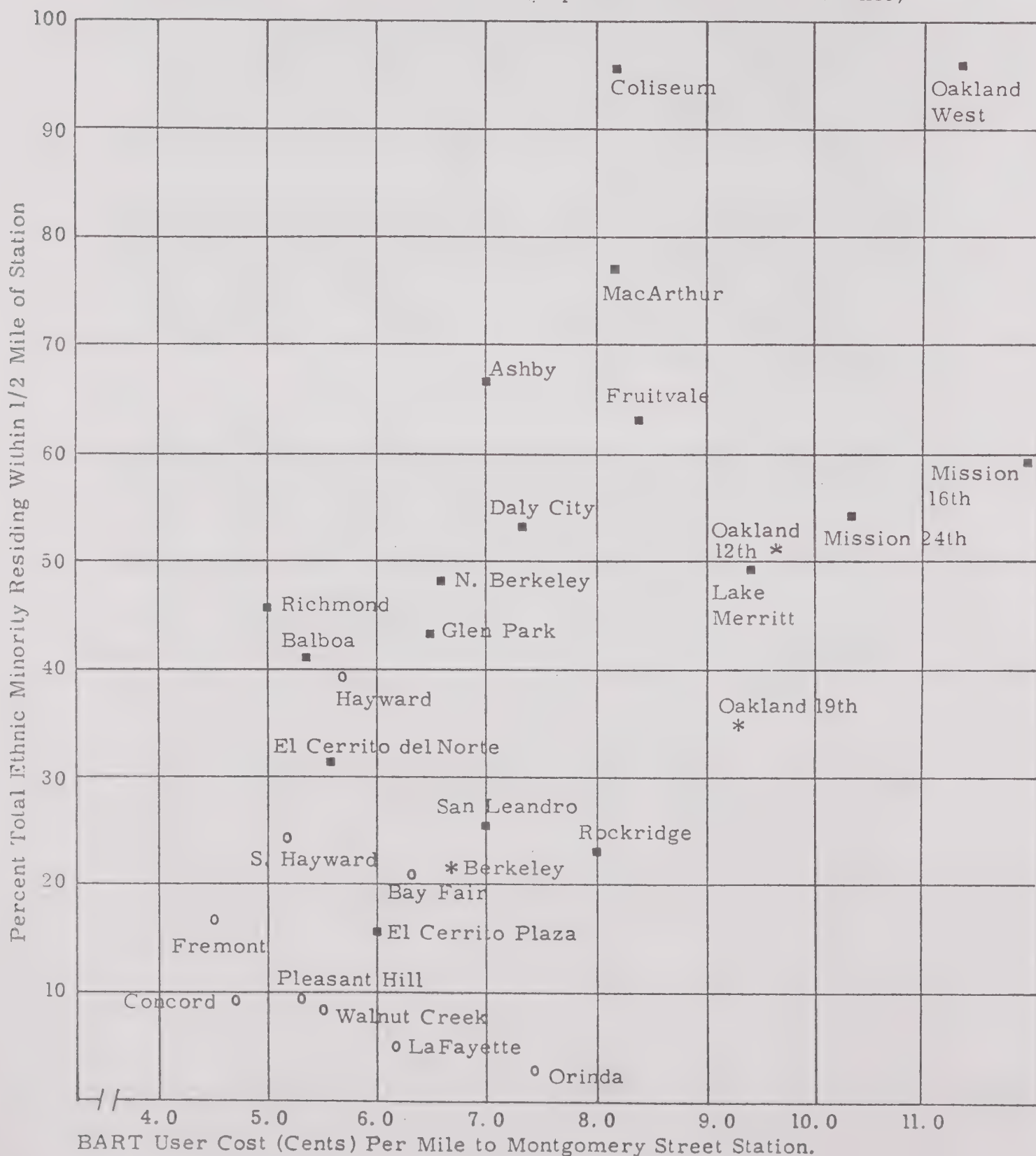
Figure 7-1 graphically shows the relation between degree of ethnic minority concentration around origin stations and BART fare per mile to the San Francisco downtown Montgomery Street Station. A fairly strong linear relationship is illustrated in these data with cost per mile increasing with the increasing total ethnic minority concentration.

### Conclusion

From the beginning of operations, BART has employed a fare structure which is graduated for distance of travel and which is therefore more equitable than a flat fare system in terms of cost per mile. The net effect of the fare changes adopted in 1975 has been to increase regressivity in the fare structure with respect to travel distance. BART's initial fare structure formula included reduced costs per mile for long trips. The fare changes adopted in 1975 represented further reduction in the comparative costs for long trips versus short trips. The fare for shorter BART trips was generally increased more than for longer trips. Since ethnic minority travelers in the Bay Area live closer in to the central areas of the region where typical travel distances are shorter, average user costs per mile are higher for these travelers than for the general population. Average fare per mile for trips to the San Francisco CBD is approximately 25 percent higher from stations located in areas of high ethnic minority concentration than from stations in areas of low ethnic minority concentration. Decreasing marginal fare per mileage increment favors the long distance BART travelers, who are more likely to be White, upper-income suburban residents.

Figure 7-1

FARE TO SAN FRANCISCO CBD (MONTGOMERY STREET STATION)  
VERSUS DEGREE OF ORIGIN STATION AREA ETHNIC MINORITY  
POPULATION CONCENTRATION (Population within One-half Mile)



\* Downtown Station

Source: BARTD. "Mileage Fare Table, Report T3002. January, 1977.

and McGuire, Chester. "Who Are the Transportation Disadvantaged."



### III. IMPLICATIONS

The overall purpose of the ITD Project is to identify the implications for the transportation disadvantaged of the BART system, and to draw these in such a manner as to permit their transferability to other major urban areas considering or pursuing development of rapid rail mass transportation systems such as BART. The investigation of seven BART-related economic impact issues in this report has resulted in the following initial listing of BART's economic implications for the transportation disadvantaged. A complete and finalized identification of implications will be included in the Final Report of the ITD Project. It will include not only economic implications, but will also integrate the implications for the transportation disadvantaged of BART's environmental, mobility and land use and urban development impacts.

#### Economic Benefits of BART for Ethnic Minorities

Expectations of the economic, employment and financial benefits of a rapid rail system in the Bay Area have generally exceeded the reality of BART's impacts to date.

Perhaps the principal implication for other areas considering regional rapid rail transit systems is that expectations regarding the level of economic impacts of construction and operations may be more realistic than was the case in the planning of BART as a result of what has been learned in the BART experience to date. In particular, major economic impacts on the transportation disadvantaged should not be anticipated with the development of similar systems. While the short-term economic effects related to the magnitude of BART's construction expenditures were significant, long-term economic impacts have either been relatively modest in terms of the area's overall economy, or difficult to isolate from other factors — many of which may be more important in shaping the economic patterns of the region.

The BART experience implies that rapid rail transit may not be expected to substantially affect the geographic distribution of employment locations, or work-related accessibility within a regional area with similar characteristics. Studies to date suggest that BART's impact on land use and economic activity within the service corridor has been largely restricted to the downtown areas of

San Francisco and Oakland, where redevelopment and land use regulatory changes coincided with BART's planning and construction. Outside the central business areas, BART's overall impact on the level of economic activity has been relatively small, particularly in the mixed land use, older urban station areas where BART provided accessibility improvements are the least and where ethnic minorities live in the greatest concentrations.

BART has provided some benefits for the ethnic minority community of the Bay Area in terms of employment opportunities. This has been primarily a result of direct employment by BART as a new transit operator, expanding the transit industry sector of the region, providing higher wage and job classification positions, and pursuing affirmative action hiring and promotion practices. However, the implication for planning elsewhere is that the net effect on employment opportunities for the ethnic minority population may be relatively small given the small size, relative to the total economy, of the work force required for a rapid rail system. The benefits of BART's construction for ethnic minorities appear to have been primarily short-term income effects with relatively little long-term job-skill enhancement since BART construction occurred prior to more rigorous current equal opportunity employment requirements and lacked extensive apprenticeship programs. Construction of new major rail systems today in other areas could be expected to provide more significant employment benefits for minority construction industry workers and businesses.

Accessibility to downtown employment opportunities has not been significantly improved for ethnic minorities living in the closer-in areas of the region where bus and streetcar service is competitive with BART. The potential of greater accessibility connecting inner-city residents with the growing number of jobs in the outlying suburban reaches of the region has not materialized to any great extent as a result of BART based on observed commuting levels to such areas. Within the immediate station areas in ethnic minority neighborhoods, BART has apparently had little impact on the character or extent of minority business or employment opportunities.

A principal implication of the BART experience is that a commuter rapid rail system which is designed primarily to serve peak period, long distance work travel from outlying areas to the downtown business areas of the region will provide the least economic benefits for the ethnic minority population which lives in greatest concentrations in the central and largely built-up urban areas. To the extent that land use and economic activity impacts are minimal outside downtown areas, the economic benefits of a new rail system for ethnic minorities, will be primarily limited to direct employment opportunities provided by this additional element of the transit sector.

### Economic Burden of BART for Ethnic Minorities

The total costs of constructing a 71 mile rapid rail system in the Bay Area will be \$2.3 billion by the time the financing bonds issued by the BART district are retired. Since federal capital assistance funding has contributed so little to the funding of BART's construction, local property and sales tax revenues have provided the majority of BART's capital expenditures financing. These tax revenue sources are regressive in that they require a greater proportion of the incomes of lower-income households than they require of more affluent households.

The experience of financing BART's operational costs, however, may be more relevant than BART's construction financing to other parts of the country considering rail systems at this time or in the future. Contrary to expectations, fare revenues have not been sufficient to meet operating costs (approximately 35% in 1976-77 total operating costs), leaving a large operational deficit to be financed primarily by taxes on retail sales and property in the BART District. This also imposes the heaviest burden on the household sector of the BART District, with the heaviest relative burden imposed on low-income families and individuals. Also, because of the residential geographic distribution of ethnic minorities and the fare structure of BART which provides for decreasing incremental costs for longer distance travel, the user cost per mile for potential BART trips by ethnic minorities is higher than for the general population. However, BART's graduated fare structure is clearly more equitable than a flat fare system.



Several implications regarding the economic burden of rapid rail systems such as BART may be drawn from the experience in the Bay Area. The introduction of BART in the regional transit system occurred in an area where both the level and costs of public transportation were higher than in most parts of the country. The financing plan that has evolved to pay for this relatively expensive component of the regional transit system has not, as of yet, developed an alternative to its reliance on local regressive revenue sources. As a result, households and especially lower-income families and individuals bear the heaviest burden of the costs of BART's operation. When a larger share of the costs of funding the operating deficits of rapid rail systems is supported by federal and state assistance deriving from progressive personal and corporate income taxes, and/or when less regressive means of local revenue funding sources are pursued, a more equitable financing plan may be possible in terms of the established notion of ability-to-pay equity.

To the extent that the income distribution, residential location, and employment patterns of the ethnic minority populations of other regions are similar to those of the Bay Area, a disproportionately small travel service benefit for these groups should be anticipated as part of the implementation of a regional, commuter-oriented rapid transit system. Economic and land use benefits of the transportation disadvantaged may be expected to be correspondingly low. Therefore, equity considerations require that a major policy objective in the development and financing of such systems should be to pursue financing methods which provide for a closer correspondence of burden and benefit among the population groups affected, and to minimize regressivity in the methods of raising revenues to pay for them.

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